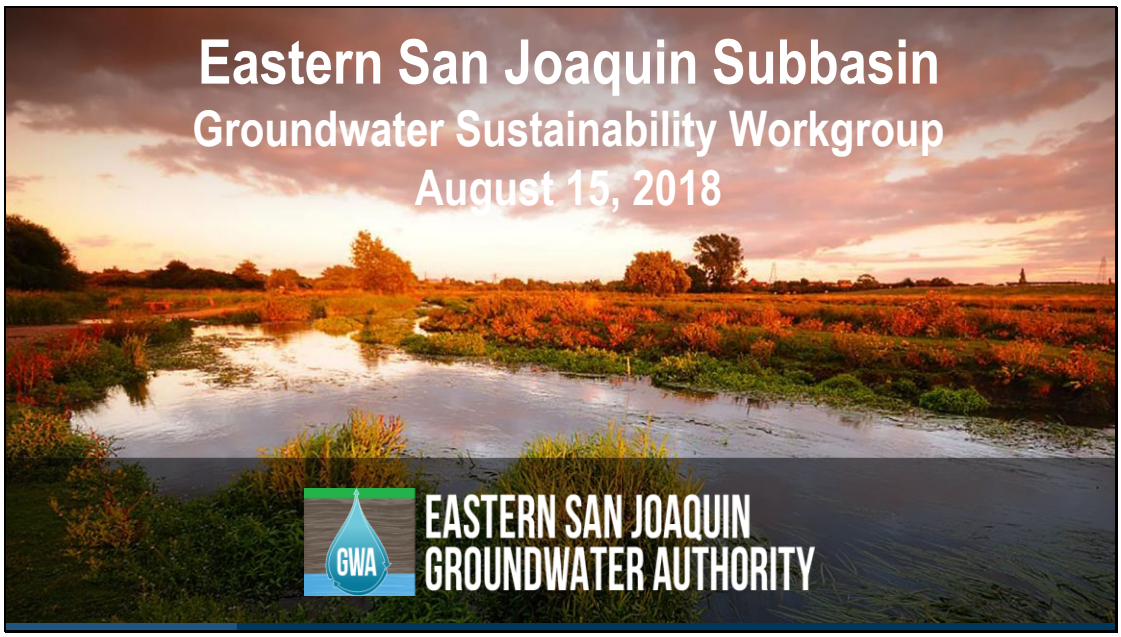
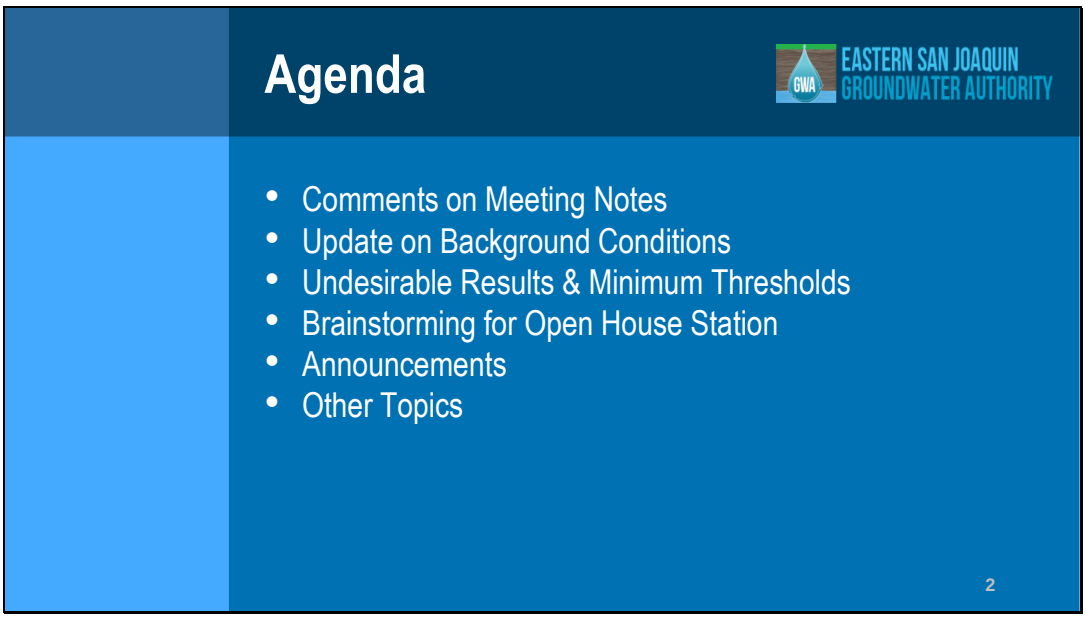
Slide 1

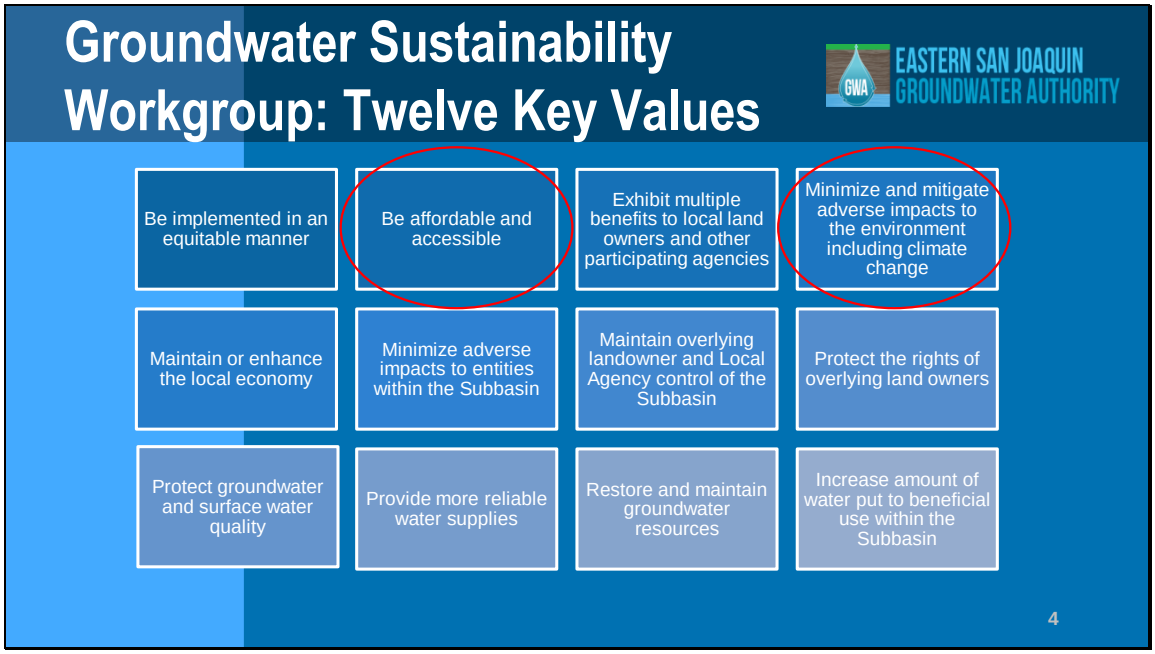

Eastern San Joaquin Subbasin
Groundwater Sustainability Workgroup
August 15, 2018
GWA
EASTERN SAN JOAQUIN
GROUNDWATER AUTHORITY

Slide 2


Agenda
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
Comments on Meeting Notes
Update on Background Conditions
Undesirable Results & Minimum Thresholds
Brainstorming for Open House Station
Announcements
Other Topics
2

Slide 3

Slide 4


Groundwater Sustainability Workgroup: Twelve Key Values
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
Be implemented in an equitable manner
Be affordable and accessible
Exhibit multiple benefits to local land owners and other participating agencies
Minimize and mitigate adverse impacts to the environment including climate change
Maintain or enhance the local economy
Minimize adverse impacts to entities within the Subbasin
Maintain overlying landowner and Local Agency control of the Subbasin
Protect the rights of overlying land owners
Protect groundwater and surface water quality
Provide more reliable water supplies
Restore and maintain groundwater resources
Increase amount of water put to beneficial use within the Subbasin
4

Slide 5

Slide 6

Well Data Availability

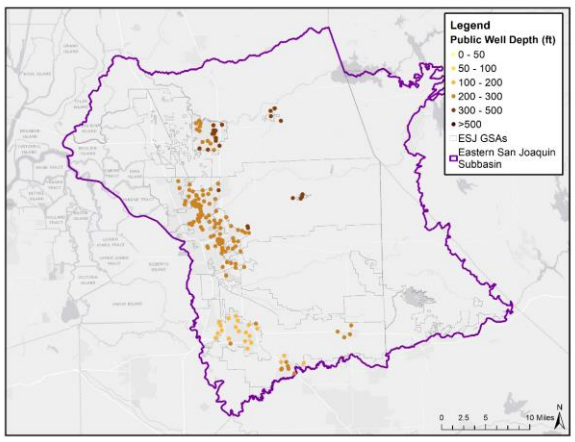
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

Dataset		Count	Data Provided				
			Well Type	Well Depth	Groundwater Levels	Groundwater Quality	Well Location
CASGEM		147	(Limited)	(Limited)	X		X
CASGEM (Voluntary)		685	(Limited)	(Limited)	X		X
CV-SALTS	*CDPH*	650	X	X		X	X
	Dairies	534	X	X		X	X
	GeoTracker	650	X	X		X	X
Data Received Directly from GSAs		243	X (Public and monitoring wells)	X	(Limited)	X	X
GAMA		225	X	(Limited)		X	X
OSWCR	*Domestic*	10,034	X	X			
	Agricultural	2,909	X	X			
	Public Supply	364	X	X			
San Joaquin County		193	(Limited)	(Limited)	X		X

Slide 7

Public Supply Well Distribution and Depth

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

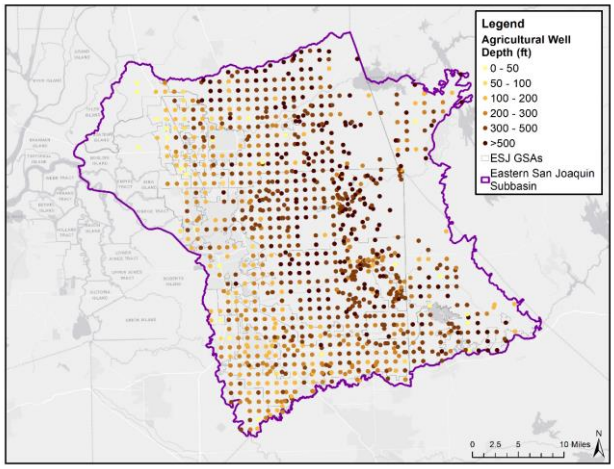


- Public supply wells are clustered around urban centers

Slide 8

Agricultural Well Distribution and Depth

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY



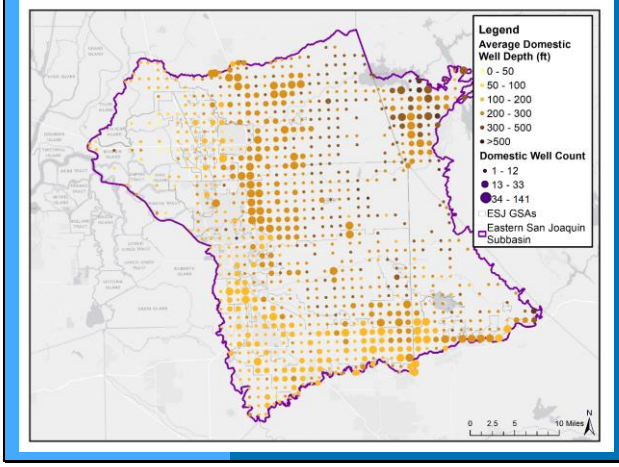
- Agricultural wells are widely distributed and increase in depth as you move from West to East

8

Slide 9

Domestic Well Distribution and Depth

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

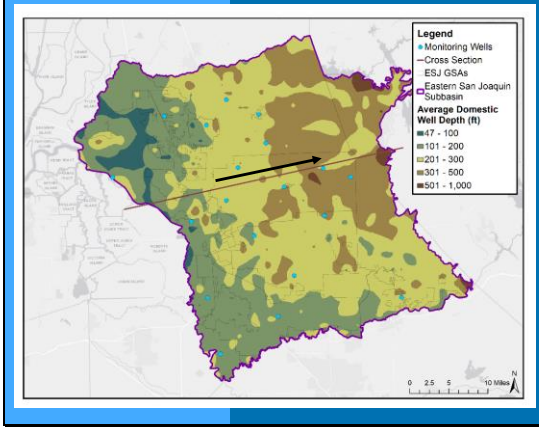


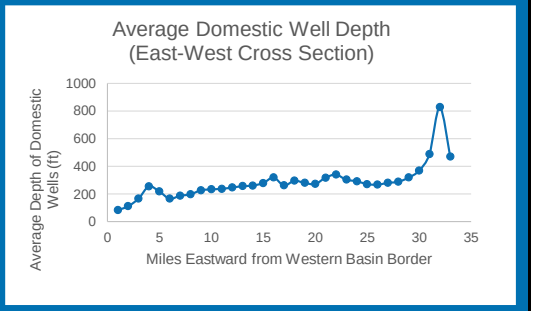
- Domestic wells are widely distributed, generally shallower, and increase in depth as you move from West to East

Slide 10

Average Domestic Well Depth

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY



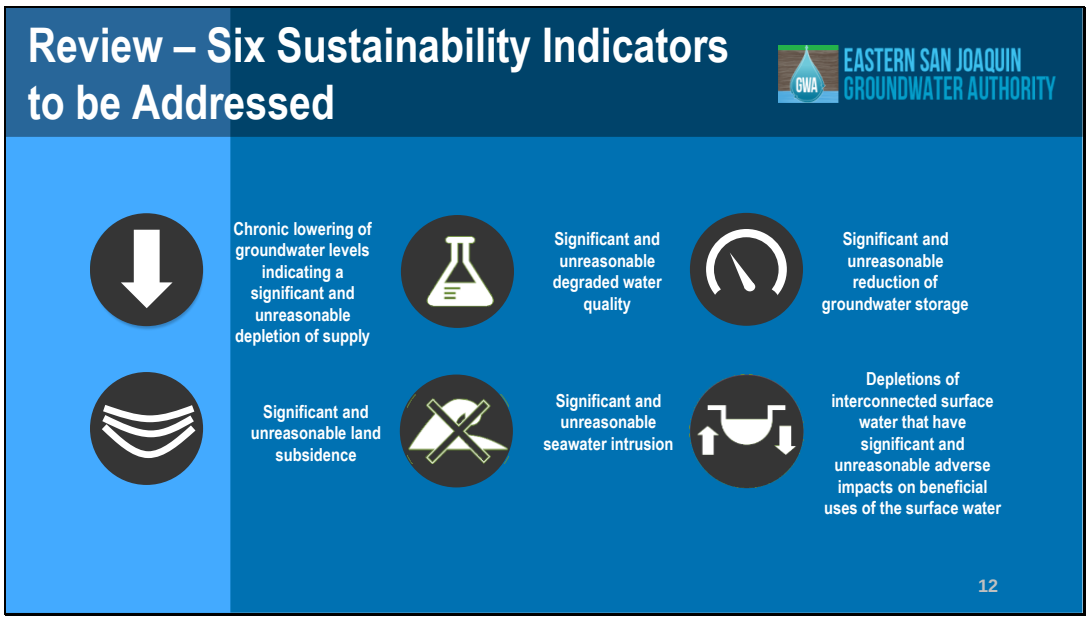


Source: OSWCR

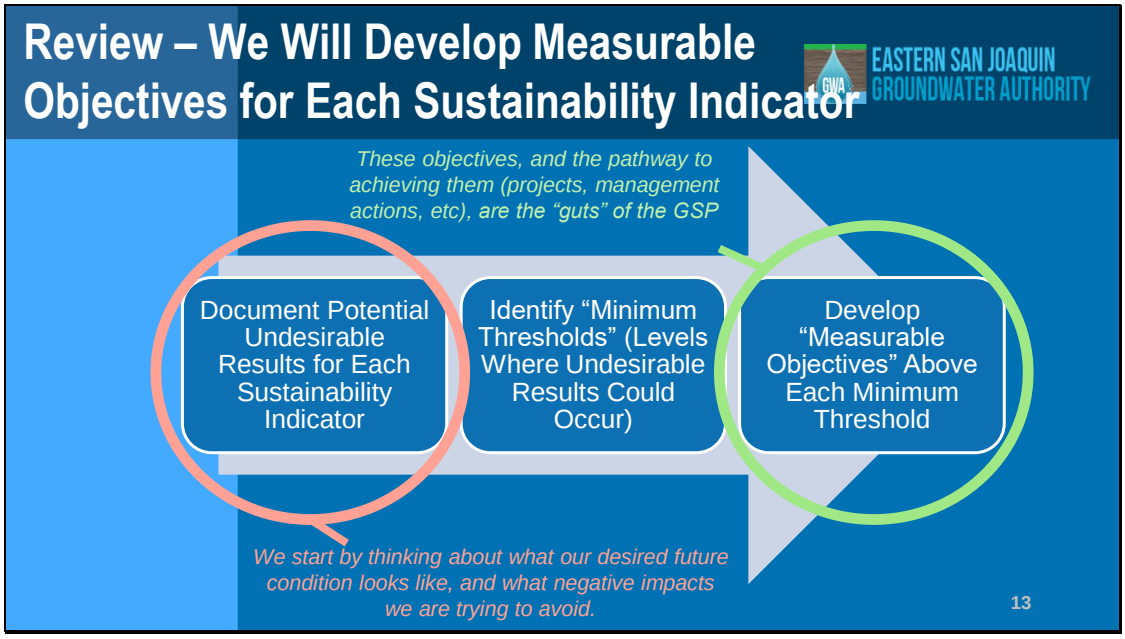
10

Slide 11

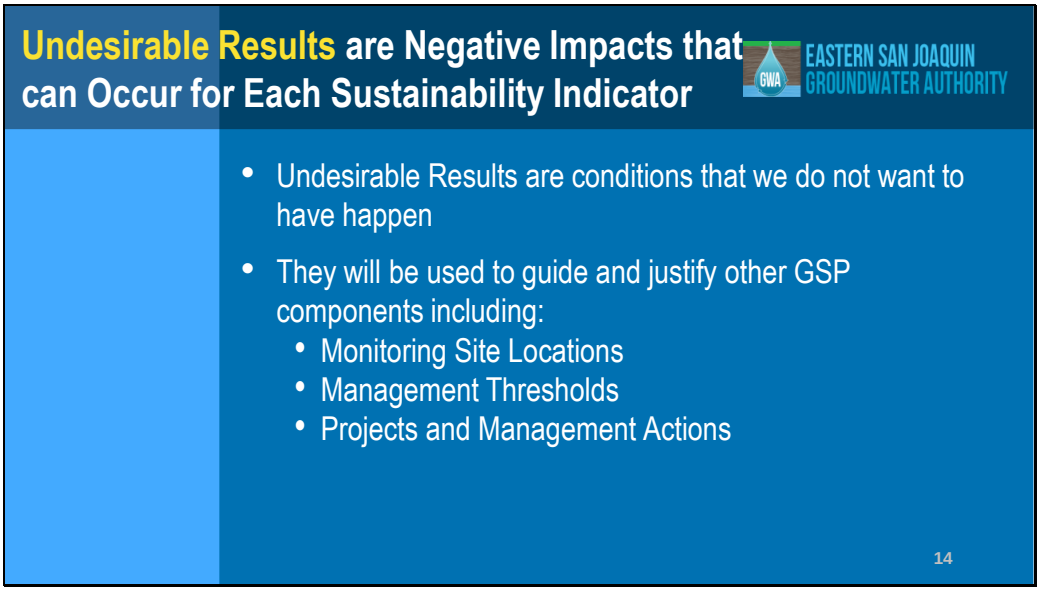
Slide 12


Review – Six Sustainability Indicators to be Addressed
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply
Significant and unreasonable degraded water quality
Significant and unreasonable reduction of groundwater storage
Significant and unreasonable land subsidence
Significant and unreasonable seawater intrusion
Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water
12

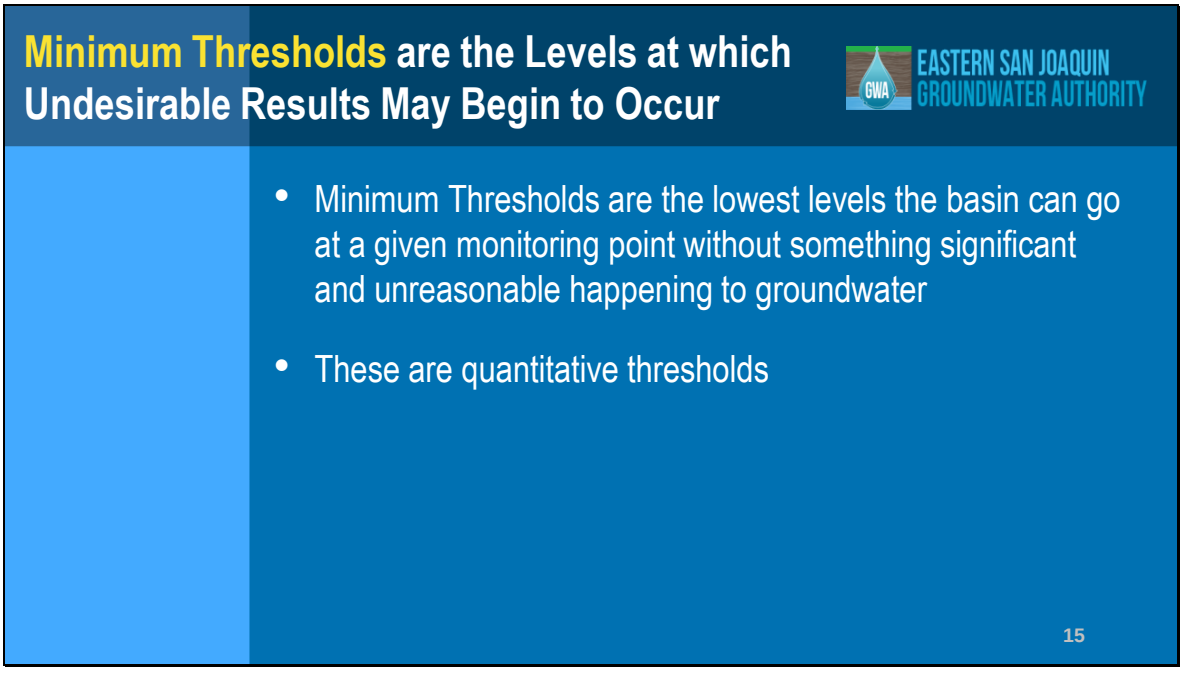
Slide 13


Review – We Will Develop Measurable Objectives for Each Sustainability Indicator
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
These objectives, and the pathway to achieving them (projects, management actions, etc), are the "guts" of the GSP
Document Potential Undesirable Results for Each Sustainability Indicator
Identify "Minimum Thresholds" (Levels Where Undesirable Results Could Occur)
Develop "Measurable Objectives" Above Each Minimum Threshold
We start by thinking about what our desired future condition looks like, and what negative impacts we are trying to avoid.
13

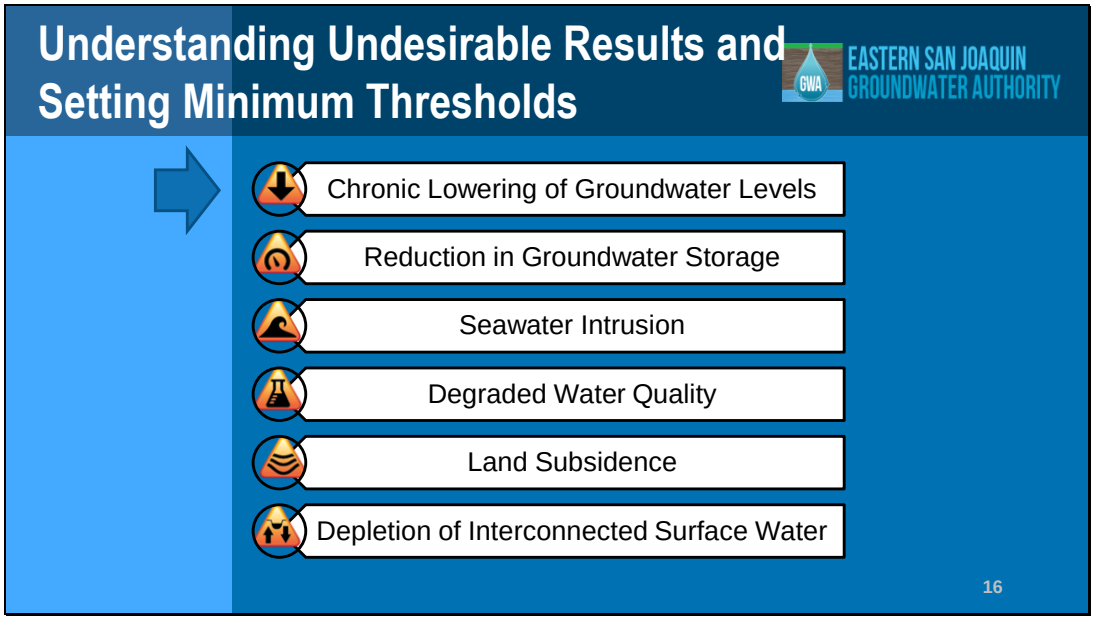
Slide 14


Undesirable Results are Negative Impacts that can Occur for Each Sustainability Indicator
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
• Undesirable Results are conditions that we do not want to have happen
• They will be used to guide and justify other GSP components including:
• Monitoring Site Locations
• Management Thresholds
• Projects and Management Actions
14

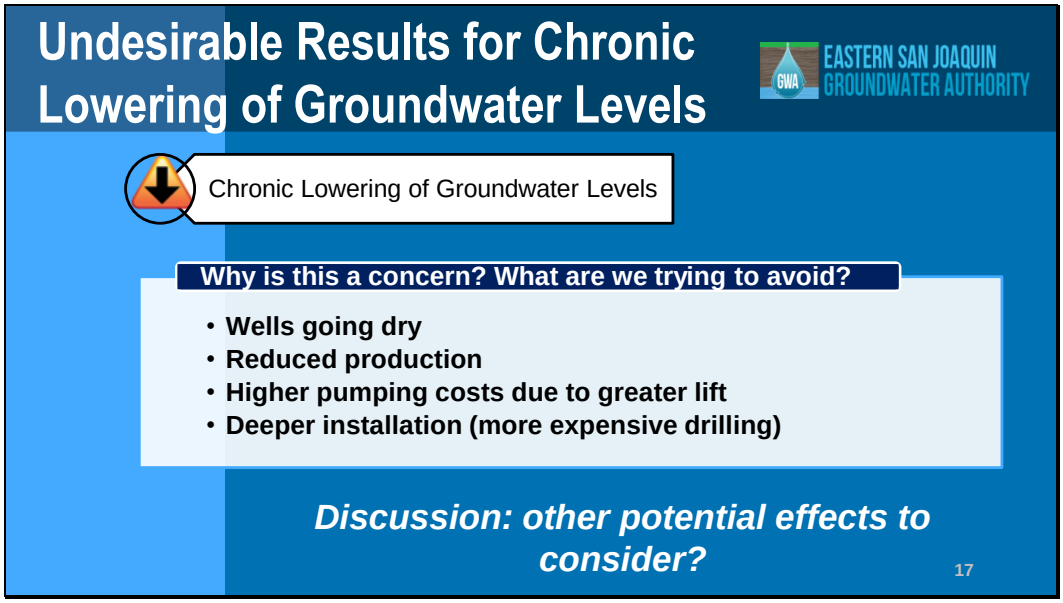
Slide 15


Minimum Thresholds are the Levels at which Undesirable Results May Begin to Occur
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
• Minimum Thresholds are the lowest levels the basin can go at a given monitoring point without something significant and unreasonable happening to groundwater
• These are quantitative thresholds
15

Slide 16


Understanding Undesirable Results and Setting Minimum Thresholds
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
Chronic Lowering of Groundwater Levels
Reduction in Groundwater Storage
Seawater Intrusion
Degraded Water Quality
Land Subsidence
Depletion of Interconnected Surface Water
16

Slide 17


Undesirable Results for Chronic Lowering of Groundwater Levels
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
Chronic Lowering of Groundwater Levels
Why is this a concern? What are we trying to avoid?
• Wells going dry
• Reduced production
• Higher pumping costs due to greater lift
• Deeper installation (more expensive drilling)
Discussion: other potential effects to consider?
17

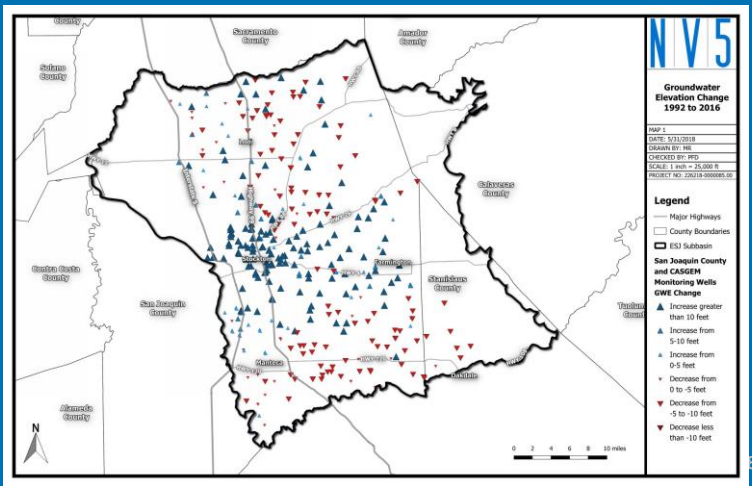
Slide 18

Review – Groundwater Elevation Conditions

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

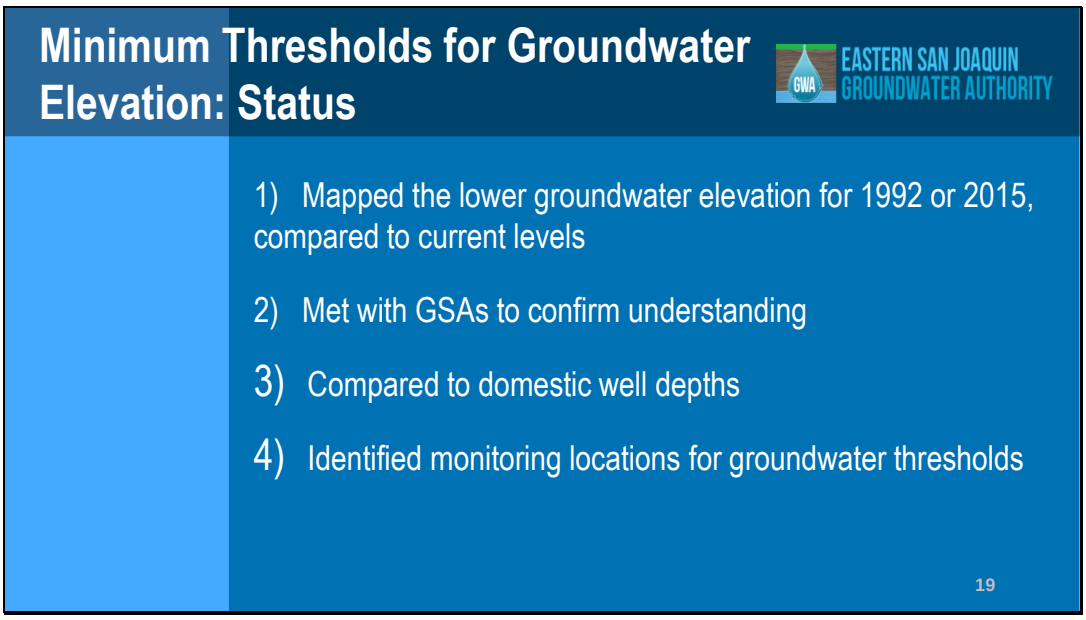
(blue) – Areas that have recovered since 1992 drought

(red) – Areas that have declined since 1992 drought

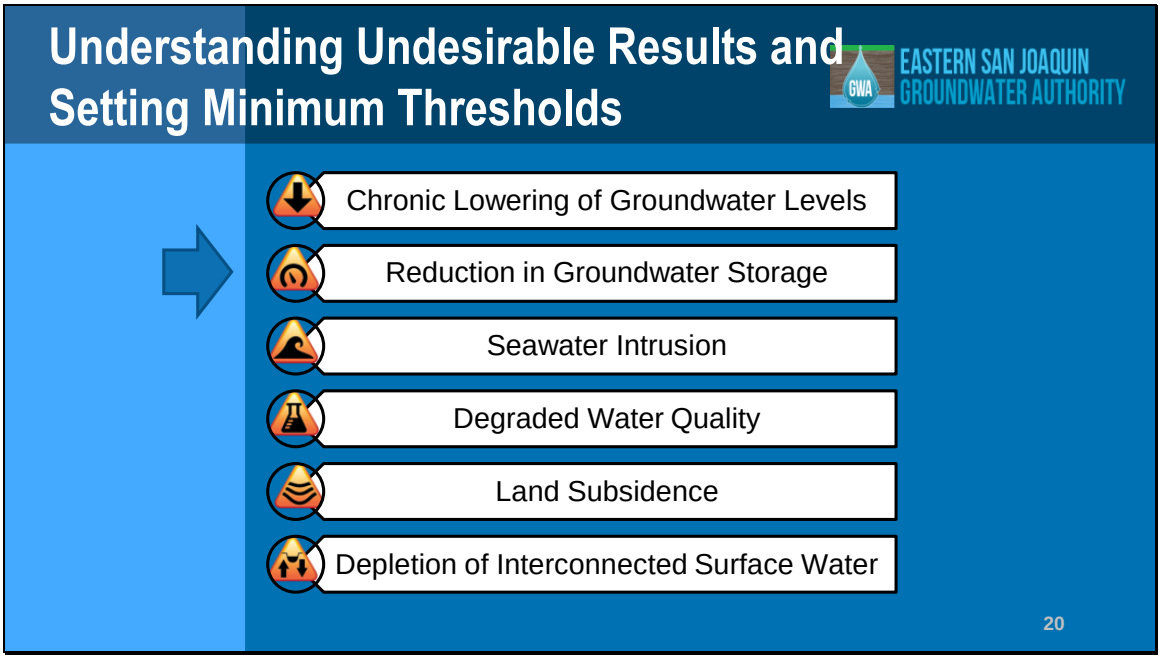


8

Slide 19


Minimum Thresholds for Groundwater Elevation: Status
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
1) Mapped the lower groundwater elevation for 1992 or 2015, compared to current levels
2) Met with GSAs to confirm understanding
3) Compared to domestic well depths
4) Identified monitoring locations for groundwater thresholds
19

Slide 20


Understanding Undesirable Results and Setting Minimum Thresholds
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
Chronic Lowering of Groundwater Levels
Reduction in Groundwater Storage
Seawater Intrusion
Degraded Water Quality
Land Subsidence
Depletion of Interconnected Surface Water
20

Slide 21

Undesirable Results for Reduction in Groundwater Storage

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

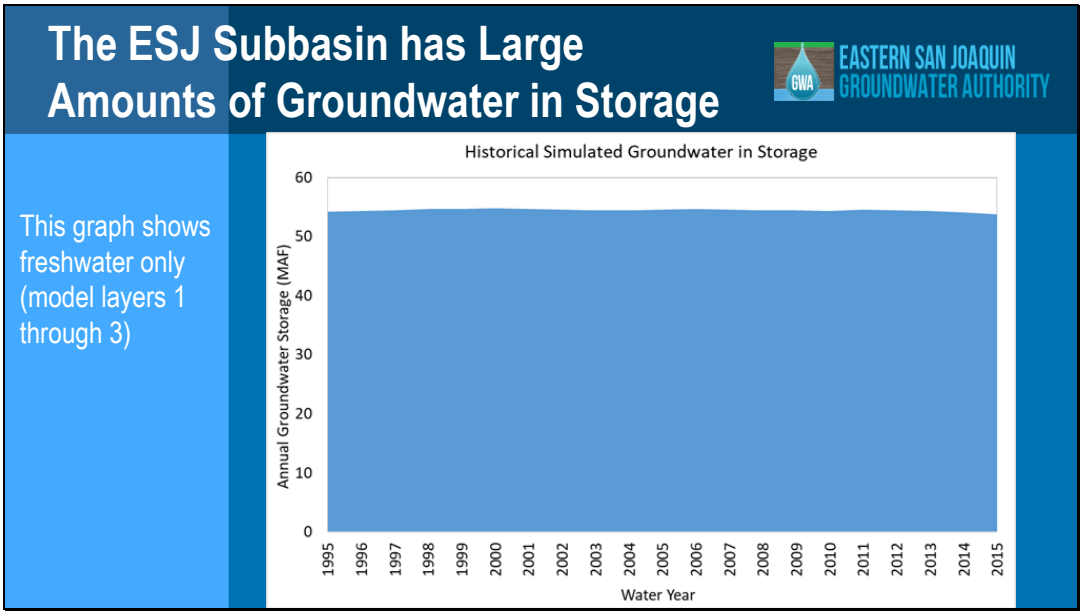
Reduction in Groundwater Storage

Why is this a concern? What are we trying to avoid?

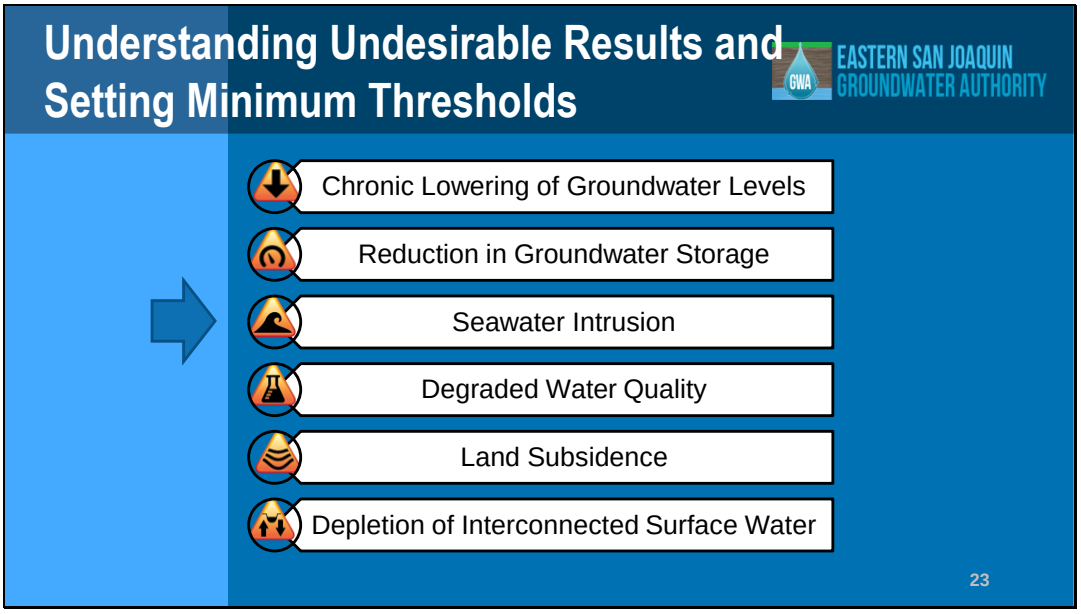
- **This is not a major concern**
- **Large basin storage (42 MAF), no chronic reduction that impacts supply needs**
- **Undesirable result = running out of sufficient storage to get through drought**

****This does not mean we do not need to bring the basin into balance, it only means that groundwater-related impacts will be more sensitive to other indicators, such as groundwater elevations.*

Slide 22


The ESJ Subbasin has Large Amounts of Groundwater in Storage
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
This graph shows freshwater only (model layers 1 through 3)
Historical Simulated Groundwater in Storage
Annual Groundwater Storage (MAF)
60
50
40
30
20
10
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Water Year

Slide 23


Understanding Undesirable Results and Setting Minimum Thresholds
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
Chronic Lowering of Groundwater Levels
Reduction in Groundwater Storage
Seawater Intrusion
Degraded Water Quality
Land Subsidence
Depletion of Interconnected Surface Water
23

Slide 24

Undesirable Results for Seawater Intrusion

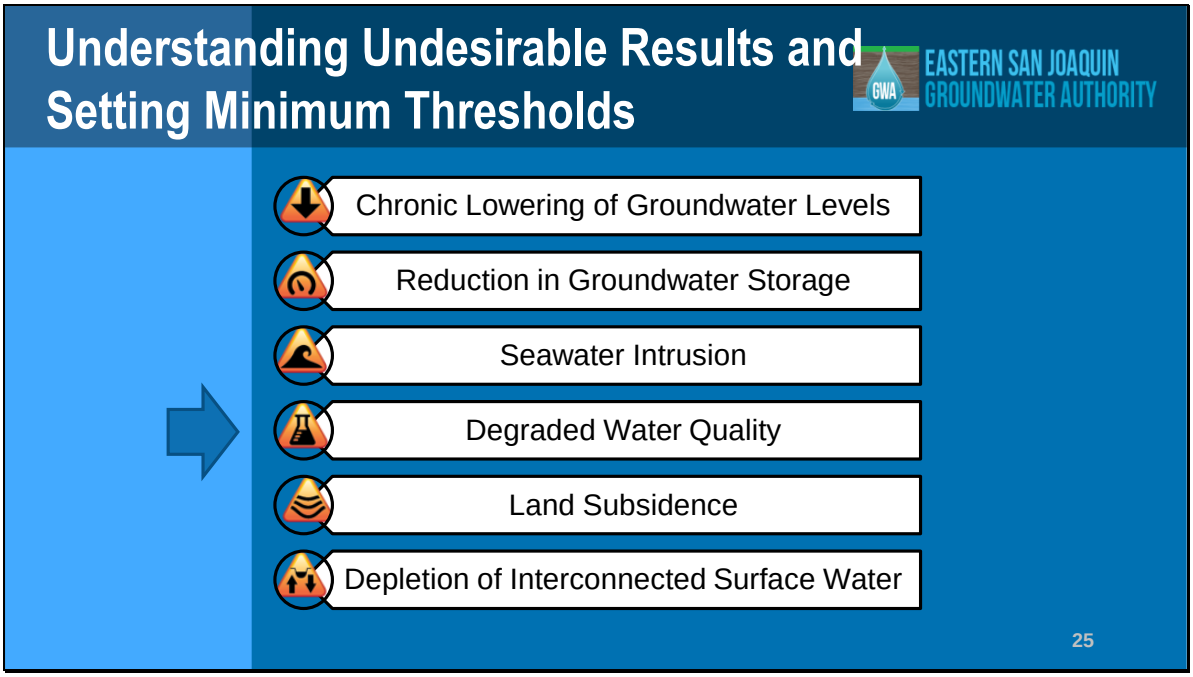
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

Seawater Intrusion

Why is this a concern? What are we trying to avoid?

- **Direct seawater intrusion does not occur in the Subbasin and thresholds do not need to be addressed; salinity will be addressed via the Water Quality Sustainability Indicator**

Slide 25


Understanding Undesirable Results and Setting Minimum Thresholds
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
Chronic Lowering of Groundwater Levels
Reduction in Groundwater Storage
Seawater Intrusion
Degraded Water Quality
Land Subsidence
Depletion of Interconnected Surface Water
25

Slide 26

Undesirable Results for Degraded Water Quality

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

Degraded Water Quality

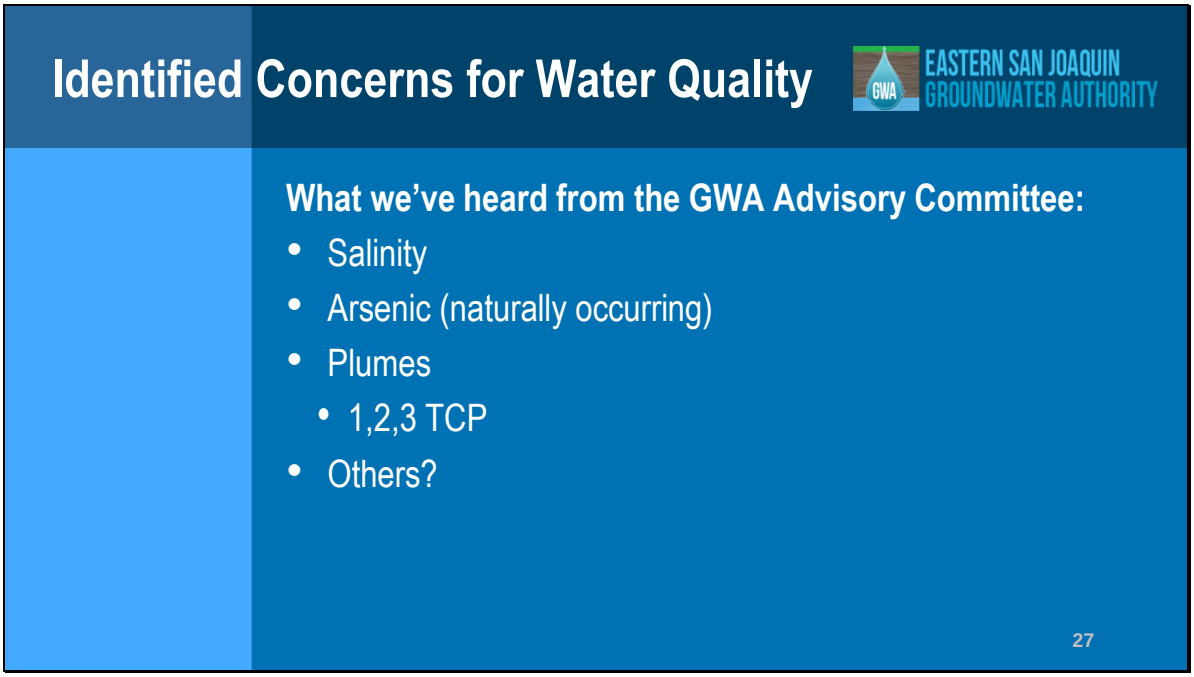
Why is this a concern? What are we trying to avoid?

- **Localized salinity issues – connate water and delta brackish water intrusion from reduced water levels**
- **Nitrates – septic and agricultural historical issues. Being addressed through CV SALTS and Irrigated Lands programs.**

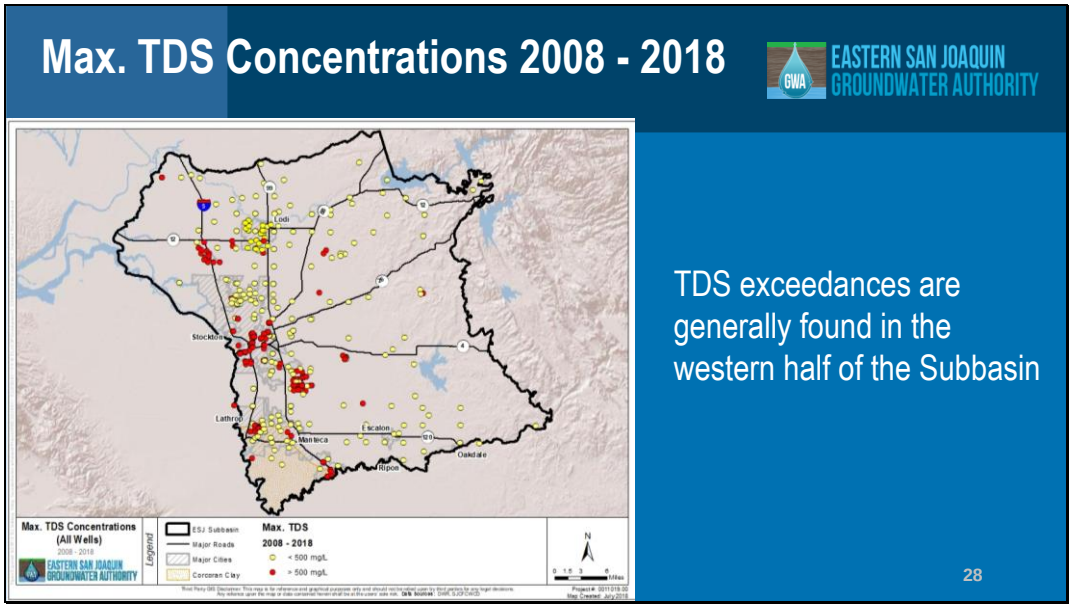
Discussion: other potential effects to consider?

26

Slide 27


Identified Concerns for Water Quality
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
What we've heard from the GWA Advisory Committee:
Salinity
Arsenic (naturally occurring)
Plumes
1,2,3 TCP
Others?
27

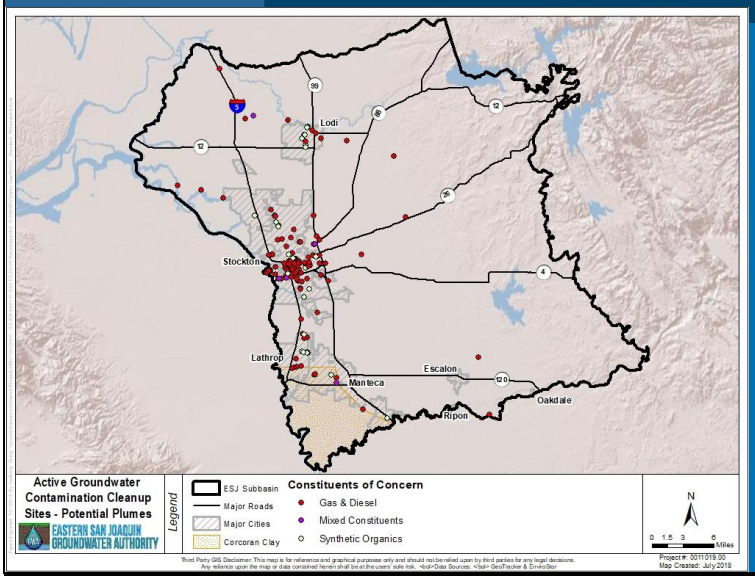
Slide 28


Max. TDS Concentrations 2008 - 2018
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
Lodi
Stockton
Lathrop
Manteca
Escalon
Ripon
Oakdale
Max. TDS Concentrations (All Wells)
2008 - 2018
Legend
ESJ Subbasin
Major Roads
Major Cities
Corcoran Clay
Max. TDS
2008 - 2018
< 500 mg/L
> 500 mg/L
N
TDS exceedances are generally found in the western half of the Subbasin
28

Slide 29

Potential Plumes

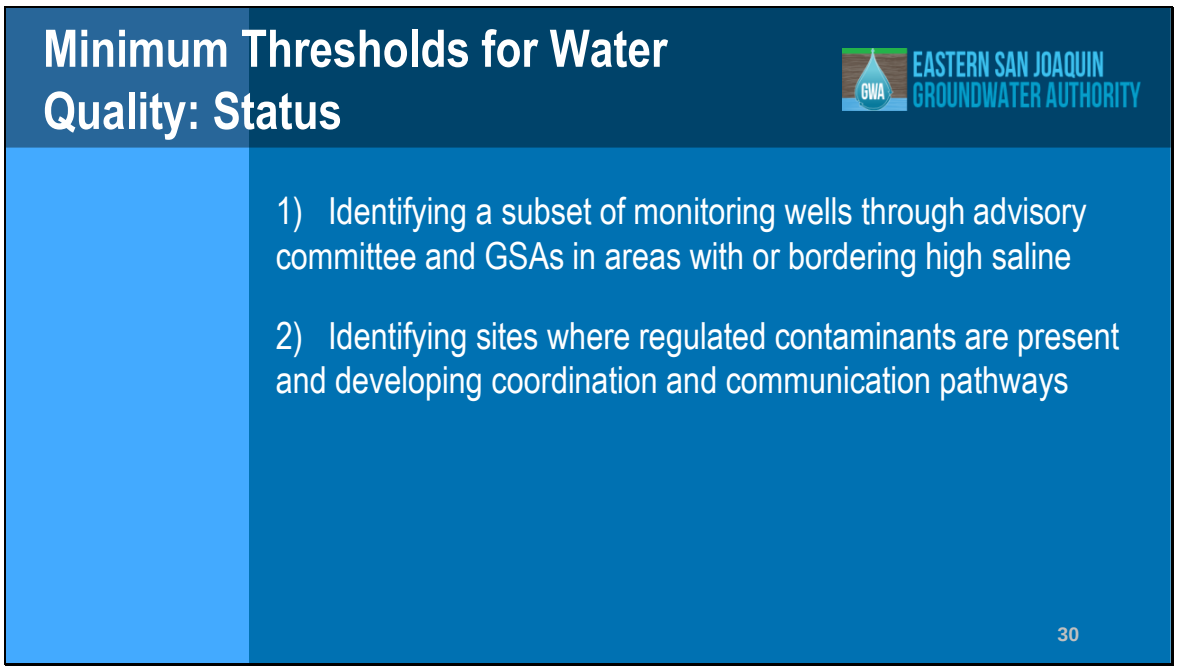
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY



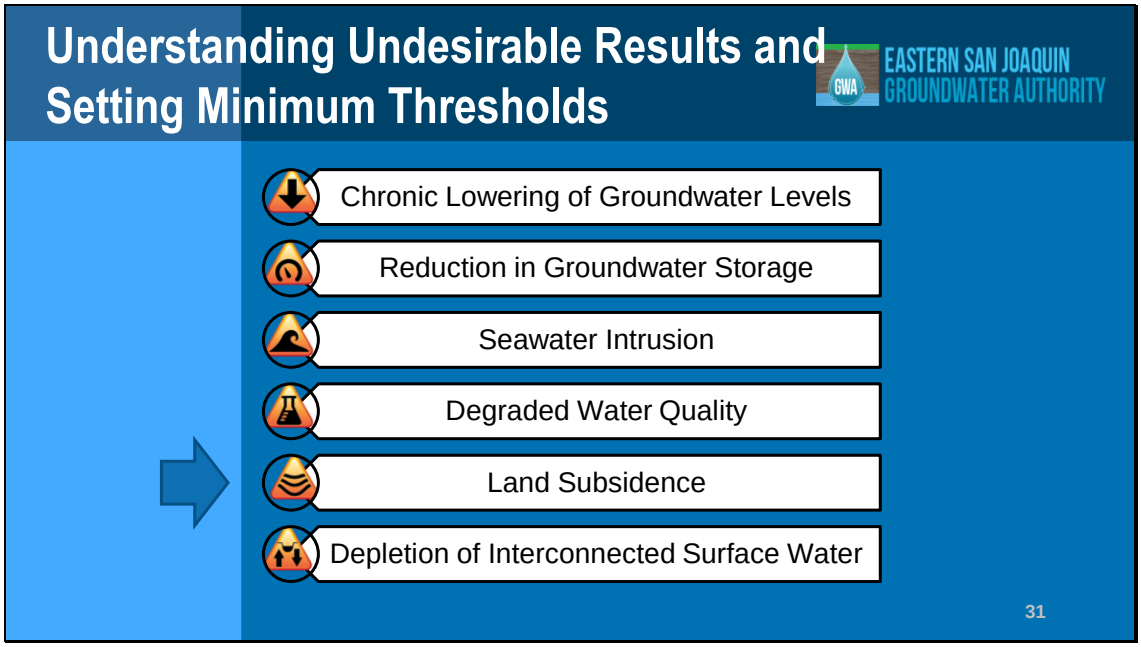
Sites with the potential to cause a groundwater plume (based on constituents)

Avoid these sites when considering monitoring programs

Slide 30


Minimum Thresholds for Water Quality: Status
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
1) Identifying a subset of monitoring wells through advisory committee and GSAs in areas with or bordering high saline
2) Identifying sites where regulated contaminants are present and developing coordination and communication pathways
30

Slide 31


Understanding Undesirable Results and Setting Minimum Thresholds
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
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Land Subsidence
Depletion of Interconnected Surface Water
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Slide 32

Undesirable Results for Land Subsidence

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

Land Subsidence

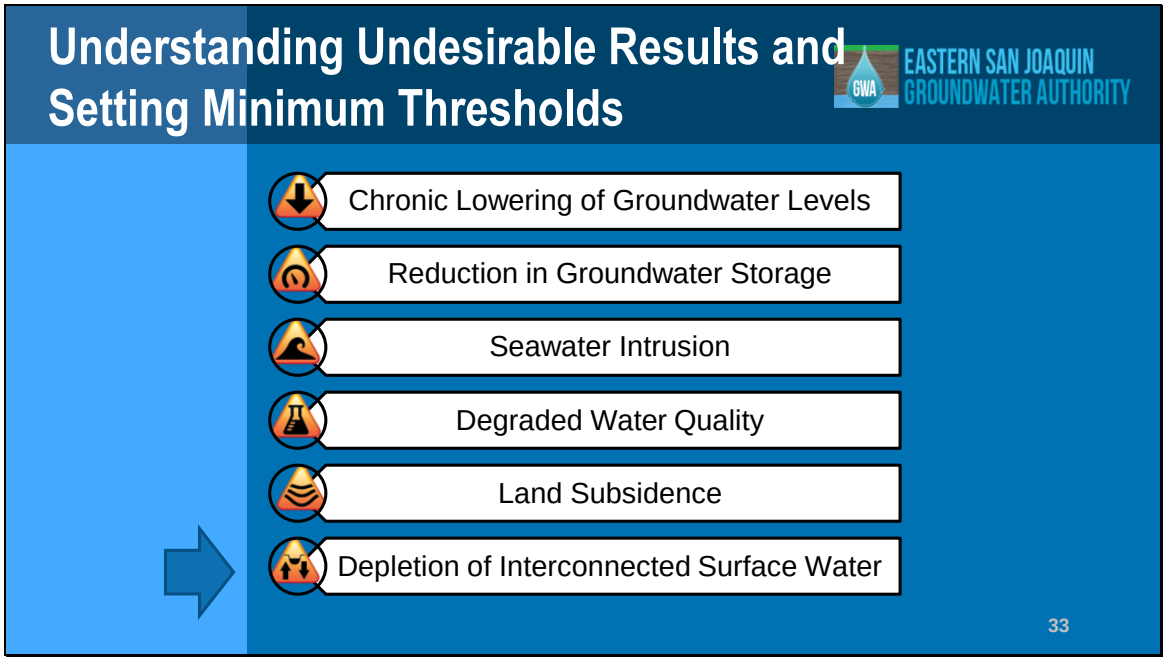
Why is this a concern? What are we trying to avoid?

- **Impacts to private and public infrastructure**

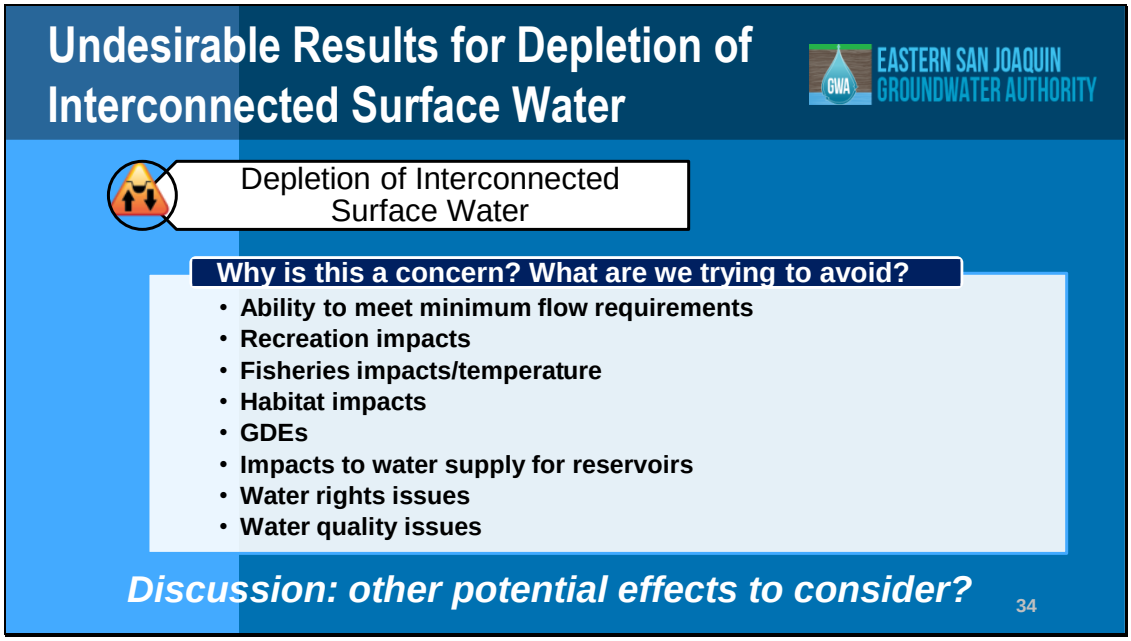
Discussion: other potential effects to consider?

32

Slide 33


Understanding Undesirable Results and Setting Minimum Thresholds
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
Chronic Lowering of Groundwater Levels
Reduction in Groundwater Storage
Seawater Intrusion
Degraded Water Quality
Land Subsidence
Depletion of Interconnected Surface Water
33

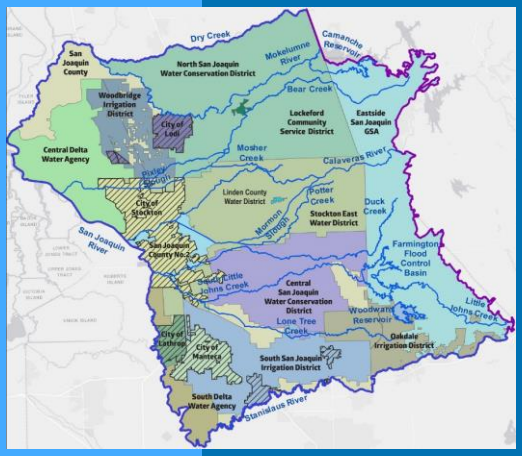
Slide 34


Undesirable Results for Depletion of Interconnected Surface Water
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
GWA
Depletion of Interconnected Surface Water
Why is this a concern? What are we trying to avoid?
• Ability to meet minimum flow requirements
• Recreation impacts
• Fisheries impacts/temperature
• Habitat impacts
• GDEs
• Impacts to water supply for reservoirs
• Water rights issues
• Water quality issues
Discussion: other potential effects to consider?
34

Slide 35

Minimum Threshold Development for Depletion of Interconnected Surface Water

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

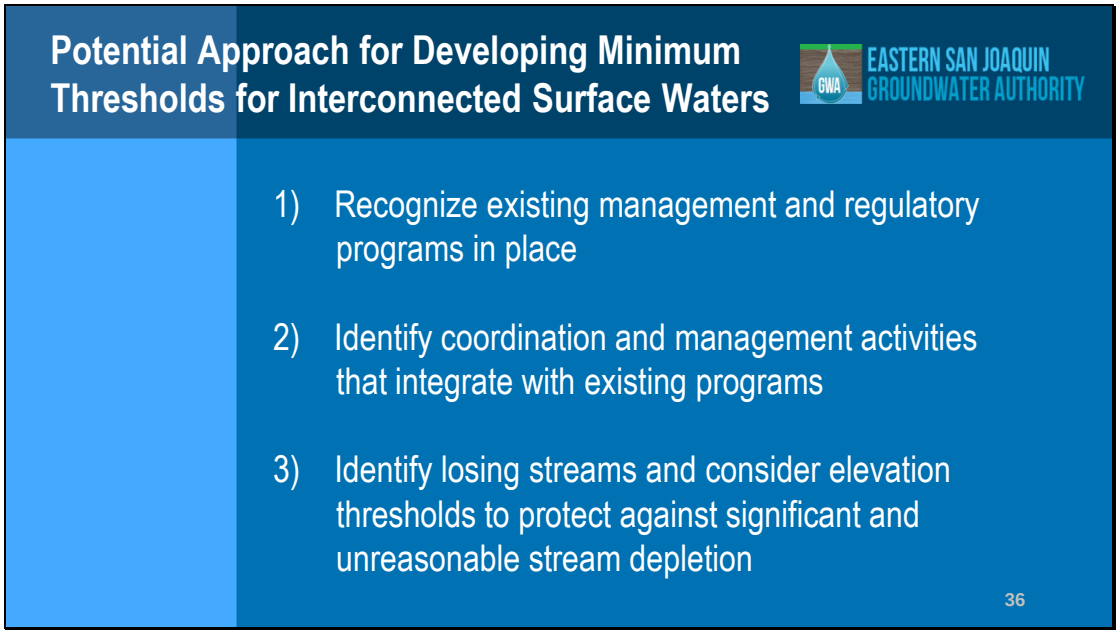


Major river systems in the Subbasin are highly managed.

Instream flow requirements, water quality standards, and water rights govern upstream releases.

35

Slide 36


Potential Approach for Developing Minimum Thresholds for Interconnected Surface Waters
EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
1) Recognize existing management and regulatory programs in place
2) Identify coordination and management activities that integrate with existing programs
3) Identify losing streams and consider elevation thresholds to protect against significant and unreasonable stream depletion
36

Slide 37

Slide 38

Public Meeting/Open House – August 29th

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

- The first Public Open House will be held on **August 29 at 6:30pm**
- The event will follow an open house format with one outreach station for each GSA
- SGMA background provided through four stations (Background, Process, Get Involved, Technology)
- GSAs are strongly encouraged to participate
- Outreach flyer provided

August 29th
6:30 p.m. – 8 p.m.
Robert J. Cabral Agricultural Center, Calaveras Room

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Slide 39

Public Meeting Outreach Efforts

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

August 29
6:30 p.m. – 8 p.m.

Robert J. Cabral Agricultural Center, Calaveras Room

Mailer: We will distribute to 400+ NGOs, local businesses & water suppliers

Bilingual Flyer: A bilingual flyer be emailed to 200+ NGOs, local businesses, and water suppliers. It has also been provided to members of the ESJ Board, Advisory Committee, & Groundwater Sustainability Workgroup

Press Release: A press release will be distributed to local media outlets & organizations with newsletters

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Slide 40

Open House Stations - Brainstorming

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

August 29
6:30 p.m. – 8 p.m.

Robert J. Cabral Agricultural Center, Calaveras Room

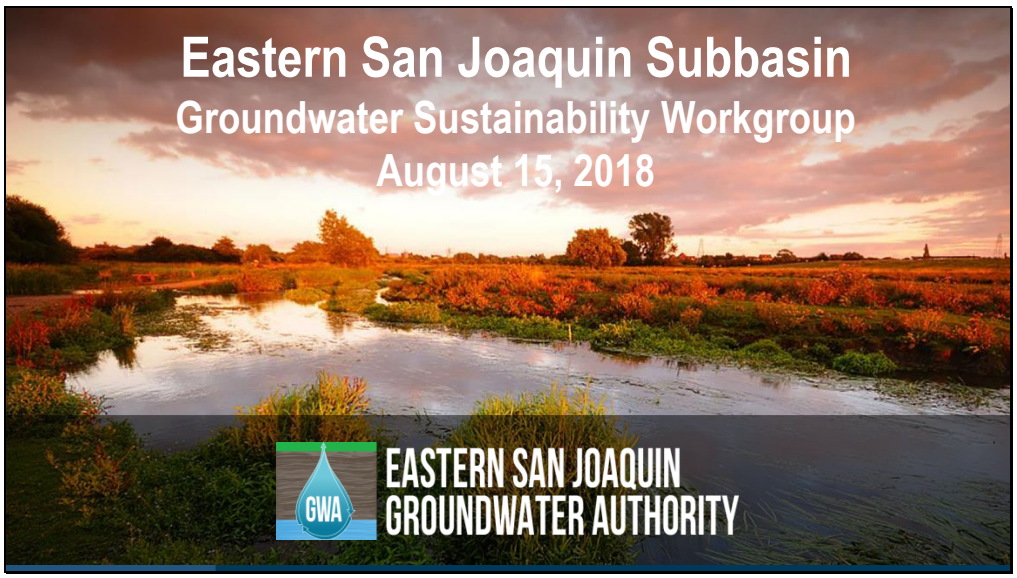
Four stations at open house:

- Background
- Process
- Get Involved
- Technology

Discussion: What are critical messages to convey at each station?

40

Slide 41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